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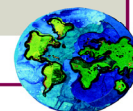
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# **THE STATUS OF KNOWLEDGE PRODUCTION ON AGRICULTURAL LANDSCAPES**

## **Lessons from fieldwork in Brazil**

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**Abstract –** The aim of this paper is to discuss the status of knowledge production on agricultural landscapes. We present two case studies, the countryside of São Luiz do Paraitinga (Upper Paraíba do Sul River, São Paulo State, Southeastern Brazil), and Belfort village (Marechal Thaumaturgo, Upper Juruá River, Acre state, Western Brazilian Amazon). The cases described show that the notion of hybridism can be applied in two ways to the production of knowledge: a hybridism of references which criteria for comparison are based on pragmatic agreements and partial connection; and a hybridism of nature-cultures in which humans and non-humans make up heterogeneous networks that reconfigure over time.

**Keywords:** *hybridism; landscape; agrobiodiversity; symmetric anthropology; local knowledge*

## 1. PRODUCTION OF KNOWLEDGE, LANDSCAPES AND AGROBIODIVERSITY

The aim of this article is to discuss the status of knowledge production on agricultural landscapes. To do this we must raise two issues: the relation between the production of scientific knowledge and the production of so-called traditional or local knowledge, and the breaking away from dichotomies of the type nature-culture; environment-society; organism-environment in the process of knowledge production.

The basis for this argument is that the difference between scientific knowledge and traditional or local knowledge is not to be found in the geographical origin nor in essential elements of the content, but rather in the networks where the knowledge is to be found. This statement is based on the ethnographic research focusing on the processes of knowledge production by academic researchers and local inhabitants of a rural region in the southeast of Brazil. It is also based on supplementary research into the production and sharing of agrobiodiversity among the population of a region of the Amazon Forest.

Santos (2005) suggests that the gathering of knowledge produced by a social group can be characterized as a *constellation of knowledge* that emerges through a variety of ways (oral transmission, testing of hypotheses, observation and so on) and references (kinship, television, phenomenological experiences and so on). The idea of a constellation is used because the forming of the connections between the different contents produced depends on the power relations established between the different forms of production.

The opinion of Latour (1991) is that modernity is characterized by a game in which the purified dimensions of production of the world are shown and the hybrid dimensions are hidden. Thus, noticing the existence of operations of purification and hybridism, situating them in terms of power in the *constellation of knowledge* allows us to realize that our perception of modernity is a product of us that consider(ed) ourselves to be modern. The discovery that *we have never been modern* means we can put knowledge previously considered to be modern (mostly scientific) on another level of comparison with knowledge thought of as non-modern.

Nevertheless, the possible connections begin to follow the networks through which knowledge circulates. For instance, Mol (2002) accompanies how the knowledge from various medical specialties comes together in networks built around memos, forms, daily medical practices, and conferences. The practices of knowledge of each medical specialty produce different bodies, but these join together through the concordance of the practitioners, inasmuch as they deal with one sole body. Thus the author shows how networks relate in practice. They are not bubbles or islands, but rather they interact with each other, demonstrating what Strathern (2004) refers to as partial connections. The possibility of partial connections between different networks of knowledge production allows pragmatic consensus regarding concrete dimensions of life, breaking off with relativism in favour of the idea of ontological pluralism (Almeida, 1999).

This reasoning is possible if we consider knowledge in its role as a process: knowledge is experienced and it makes sense through being experienced. This experience, though, is not passive, it's about relationships. Thus organisms get to know environments by producing them, mixing up the very relation between organism and environment (Ingold 2000). So, cutting down a tree, sending an email, watching a bird eat a fruit, spending a morning reflecting on the meaning of a paragraph of Kant or taking the kids to school are all perfectly symmetrical examples of the practice of knowledge (Law and Mol, 2002)

I shall go on to present two case studies of different ethnographic experiences in Brazil. One in the rural area of São Luiz do Paraitinga (Upper Paraíba do Sul River, Southeast Brazil), where I studied how researchers and local inhabitants produce landscapes, and the other in the

community of Belfort (Marechal Thaumaturgo, Upper Juruá River, Acre, Western Amazonia Ocidental), where I studied how forest dwellers produce agrobiodiversity.

## **2. WHAT EXISTS IN A LANDSCAPE?**

São Luiz do Paraitinga is a small town of about 10,000 people, 4,000 of which live around the surrounding countryside, where old-growth forests had been used for small scale agriculture and were then removed to produce pasture for dairy cattle. These dairy farms have recently been replaced by eucalyptus plantations, in order to produce paper and cellulose. In this region the landscape features pockets of native vegetation, pastures where pioneer weeds are controlled by the cattle farmers by tilling or by burning, areas of eucalyptus controlled by large businesses and some horticulture spots.

Between 2003 and 2006 a group of about 15 researchers from the Universidade Estadual de Campinas (State university of Campinas), located 260 km from the municipality carried out research entitled “Biodiversity and Social Processes in São Luiz do Paraitinga”. The group was made up of ecologists and anthropologists, including me. My tasks in the research were to carry out the ethnography of the production of the landscape by the inhabitants of the rural region and also to do the ethnography of the production of the landscape by our own project. Consequently my PhD thesis (Silveira, 2008) discussed how the same geographical area was described by and the object of attention of both a group of scientists, principally ecologists, doing research and also the local population itself.

The project focused on the following approaches:

- a) producing a geo-referenced base for the classification of the landscape, classifying various elements of the landscape, particularly the matrix of pasture that surrounded the thickets of old-forest, eucalyptus woods and areas of scrub (new forest re-growth).
- b) studies of the diversity of amphibians, butterflies and vegetation, especially in the thickets of old-forest, as well as the biodiversity in the rivers and streams;
- c) anthropologic and historical studies, including the ethnography of the socio-ecological relations of the local inhabitants of the region and a study of how changes in the landscape have been documented;
- d) interdisciplinary approaches, characterized by the group's efforts to produce shared texts.

The project oscillated between an ecological perspective and one from the humanities, aiming to be above and yet connected to both these disciplines. The ecologists worked towards including social aspects in their analysis of the natural, while the anthropologists – and this difference persisted as proof of this oscillation – worked to include the natural in the social.

The knowledge practises of the researchers during the project happened in and outside São Luiz do Paraitinga. The manner in which networks were formed during the fieldwork itself was reinforced in several ways: by the previous and innovative academic experience aiming to rise above a disciplinary approach; by the debates and efforts towards integration inherent to the group's work; by the academic bodies who accepted, legitimized and financed the research (examining boards, supervisors, post-graduate programmes); by the way in which each researcher built relationships with the local population; by learning through being ‘in the field’ with the subjects of study (human and non-human), be they butterflies, smallholders or satellite images. The academic outcomes of the project were: a final report; two research papers about the general purpose of the project; three undergraduate papers; five master's degree dissertations; three PhD theses; several presentations in congresses and articles; a public meeting in São Luiz do

Paraitinga and the collaboration of the team in the preparation of the Plan of Municipal Directives.

This brief description of the constitution of this research project gives us an idea of some elements of the networks involved. These networks include a heterogeneous array of items such as forest thickets, development agencies, unreliable vehicles, field assistants, satellites, species dynamics, neighbours, pastures, eucalyptus woods, matrix, and post-graduation. A more detailed description would bring up other items such as the materials used (butterfly nets, heaters, plant presses, formaldehyde, and buckets) or the depth of the researchers' 'personal' experiences in the town (carnival songs, mud roads, cattle breeds, home-made spirits, barbed wire, break-ups, caged birds and so on).

My movements around the landscape of São Luiz do Paraitinga were initiated through connections with inhabitants of the small urban area of the town. Whilst, on the one hand there are knowledge networks linking the urban part of the town with other parts of the state and country, such as publicity for the town's calendar of traditional festivities, or visits to the town by musicians and intellectuals, or because of the rafting on the Paraibuna River by city-dwelling radical sports lovers, there is on the other hand a sense of continuity, especially through kinship bonds, between the population of the urban and the rural areas.

However, an important step to enhance my field research was to do a socio-economic survey in 114 properties located in the neighbourhoods of the 10 patches of forest where the biological inventories were carried out for the project. During this task, which took me several months, I was able, between cups of coffee and slices of cheese, to experience a mosaic of situations and identify various networks. Building on this experience, I followed up on some of these networks in search of connecting points. And it was after the questionnaire stage, walking with smallholders through the pastures hearing explanations about fence posts, cattle breeds, collecting wild herbs, accompanying felled eucalyptus trunks and attacking ants that I also learnt about kinship networks, stretching, through migration to the urban areas of the Paraíba Valley.

Through this ethnographic experience of the world of the inhabitants of that landscape, I identified a number of networks in which there was an amalgamation of circuits of kinship and neighbourhood, incomplete separations between spaces for production and spaces for conservation (see Silveira, 2009), conflicts arising from the replacement of dairy farms by eucalyptus plantations; unsuspected connections between the rural and urban. These networks indicate practices of knowledge about the landscape that are very different from those of the researchers.

The population of the chosen geographical area of São Luiz do Paraitinga also produce knowledge through their access to a variety of sources such as memories passed down to younger generations, televised information, field testing and others. It is not possible to analyse their knowledge production as being based just on ancestral knowledge or locally based knowledge (although it can be considered to be locally referenced).

The population and researchers who produce the landscapes do so related it to their previous experiences. In the case of the researchers this "previous knowledge" comes both from academically produced scientific information and from their own previous experiences and a previously and generally held understanding of the dynamics of forests. Their knowledge production includes bibliographical reviews, data production and sensory experience. When put into writing, any subjective, hybrid experience is hidden and the result is shown as purified data.

The way in which knowledge is characterized in a scientific text, being purified in the data analysis of phenomenological fallacies and any connection with what is not scientific, or being purified of hybrid dimensions, comes through as pure, or superior. Some dimensions of experience, though it may be argued not all, are, however, fundamental in order to reach the achieved results and yet they are not listed in the "Materials and Methods" of scientific texts.

We can see that both *scientific* and *non-scientific* knowledge present hybridized elements, of gestalt experience, a *concrete science*, *savage thought* and also purified elements, systemized and scientific. This shows that knowledge produced is partial and dependent on the networks that shape its practices, even those which define how to stipulate its truth. And it seems to me that, notwithstanding the final purification (that takes scientific knowledge to a hierarchically superior position), scientific knowledge production seems to be no different in substance from the practices of locally studied knowledge.

On the one hand we identified how the same geographical area is composed of landscapes that are partially different according to the sensory practices of the observer and on the other hand we saw what type of questions are asked and what type of answer these questions require. The researchers are speculating about the characteristics of specific animal and plant groups that live in a rural area of intense human activity. They are also considering how the concept of landscapes can be useful in this type of analysis about how questions regarding humans and non-humans can be formed. Furthermore, they are asking how to preserve the patches of forest and reflecting on how the smallholders think. The inhabitants are speculating how to continue living in the region; how to produce milk and vegetables; the influence of the eucalyptus plantations in their lives; how to earn money; how to bring up their children; the reasons behind urban violence; the lives of relatives who have moved to neighbouring cities; how to treat their pasture; what type of wood is most useful to them; which bird has the nicest song; who is the best rodeo rider, which song won in the last competition held before the carnival. Similar questions could be asked by the researchers, however they were not included in the research findings – the official version of the knowledge produced by us.

Hence, we can see that there are different questions that emerge from different object-landscapes. A simple relativist analysis (as opposed to one which would assert which of the versions of the landscape is closer to reality), could bring the following conclusion: the landscapes are distinct universes and each group explains the reality discovered in its own way. There is no possible communication.

In this work I argue for something different: that a relationality is possible. The contextualization given shows that questions of different natures are asked. Rather than consider that the different questions mean there is no common ground for analysis, I maintain that it is possible for human beings to reflect on others' questions and themselves ask similar questions. In other words: the objects and issues that exist in the network of the local population can be connected to the objects and issues of the researchers. Consequently, some of the terms on the lists of what exists in the landscape can be connected. This happens because there is a pragmatic relation between objects that belong on both of the lists. For example: 'tractor' and 'hoe' on the smallholders list and 'eucalyptus incorporated into reserve area' on the paper and cellulose company list can be connected with 'human action' on the researchers list, and brushwood on the ecologists' list links to 'mato' (forest) on the smallholders' list. In this last example, brushwood for the biologist is what the inhabitant of the rural area of São Luiz finds on the floor when walking through the 'mato'. So this is justification for the idea of the *researchers' landscapes* contrasting with the *inhabitants' landscapes* and their lists of items, although, for the researchers, the landscape is an explicit category and for the inhabitants it is an implicit category in which a list of objects can be grouped together. However, we would assume there would be agreement on them being spaces of a similar nature. These two versions of a sole spatial area that is experienced differently, different observers building different landscapes – though we use the same term to show that these landscapes connect one to another. Naturally, in order for this imagined dialogue to work it is necessary to impose at least two conditions: that there be a common language, where untranslated terms can be explained, and that the interlocutors can act cooperatively, sharing rules of social behaviour and adapting to new rules through their contact.

However, as Almeida (1999) warns, not everything may be communicated between different

networks. Some researchers' questions may have no equivalent for the inhabitants. An example would be the minimum size of an area of forest necessary for the biological viability of a butterfly population – a researcher's question. Another example would be the issue of the minimum size of a property for the economic viability of a certain activity – inhabitant's question.

This brings us back to the notion of pragmatic agreements in the comparison of *list of what exists*, a means of expression of heterogeneous networks. This agreement is labelled as pragmatic because it is not total, and rather partial. This is because the possibilities of agreement do not imply in any way the disappearance of dissonance between, in this case the landscapes of the inhabitant and those of the researcher. It simply means that in practice there is sufficient agreement for the objectives of each one. The dissonance, albeit inevitable, does not impede communication. From this perspective, therefore, the pragmatic agreement can be considered a type of political ontology (Almeida, 2003).

We may even suggest four possible logical operations in the ethnographic comparison of networks of practices of knowledge: juxtaposition, where there are different questions for the same question; convergence when there are the same answers to the same question; re-elaboration, in which the ethnographer offers a third answer to a same question already answered in the comparative lists, and composition, where there are new questions asked which make up new issues (see Silveira, 2008)

I believe that such operations may be usefully applied on different scales: among social groups that produce knowledge through distinct processes, but also for individuals who share many of the same items on a list and differ on few. This sound typology could even be considered to understand the production of knowledge by groups or individuals in their practice of hybridizing networks.

### **3. AGROBIODIVERSITY: PEOPLE, PLANTS AND NETWORKS**

The second ethnographic experience to be presented is that of Belfort, a riverside community on the banks of the River Juruá, in Acre state, near the Brazil-Peru border. The aim of the research was to relate people and plants, according to the networks through which the diversity of plants grown by local people is circulated.

Belfort is in the Extractive Reserve of the Upper Juruá (Reserva Extrativista do Alto Juruá), an area of Brazilian State territory that aims to bring together agrarian reform and environmental conservation. The reserve was created in 1990 after the region's rubber tappers claimed lands that were worked by them, yet belonged to the rubber barons (Almeida, 2002). At that time the extractive rubber economy was in decline and in other areas of the state of Acre the forest was being cut down to provide land for pasture.

In the last twenty years the inhabitants of the reserve have seen changes in their relationship with the forest. Rubber extraction activities have dropped drastically and the population, previously spread throughout the forest has become concentrated on the banks of the two largest rivers in the region (Almeida, 2005). There are no roads in the reserve and people get around mainly by motor-powered canoes. Hunting is still the major source of protein. Small scale cattle farming has become more common; less for protein and primarily as another source of income. Agriculture has also been through changes: beans and manioc flour, previously produced on a small scale, have joined tobacco as a source of income for the inhabitants. Publicly-funded revenue has also increased substantially, either through social programmes guaranteeing a minimum income, or through the expansion of basic public health and education services that have created jobs opportunities.

The research was carried out in Belfort between 2007 and 2008 as part of the project “Populações locais, agrobiodiversidade e conhecimentos tradicionais associados”- PACTA (Local Populations, Agrobiodiversity, and Associated Traditional Knowledge) (e.g. Emperaire and Eloy, 2008). Belfort is one of the population centres that has most grown in recent years, with an increased number of young people from the tributaries of the River Juruá marrying into town families. Nevertheless, the inhabitants make up an interconnected network of kinship, strengthened through the combination of marriage and the type of hierarchical friendship known as *compadrio*, creating strong community links.

Another recent characteristic is the increased mobility between the reserve and the municipal centres of Marechal Thaumaturgo and Cruzeiro do Sul. Consequently there is an increase in migration towards these locations and also increasing communication between the inhabitants of Belfort and their relatives who have migrated to nearby urban areas, which has had important consequences for the flows of agrobiodiversity.

At the time of the research Belfort had 27 occupied houses, 23 of them in the centre of the town, 2 upriver and 2 downriver. In the centre of the town there was also a school, an association building, an evangelical church and a community centre for producing manioc flour.

The inhabitants had contact with the issue of agrobiodiversity in different *agro-ecological areas*:

**a) forest plots:** three crops were planted: beans, tobacco and manioc, using slash and burn techniques to clear plots in the forest. The bean plots were the largest and needed areas of land that had not been over-cultivated previously. They were planted mainly for sale to middlemen. The bean seed, which itself is the product being traded was generally bought from the middleman himself, unless they had been put by from last year's harvest. The main middleman was a farmer from the region who would buy the product from inhabitants of several different communities on the reserve. Because of this it was impossible to know the exact origin of the seeds planted. The tobacco plots were also planted in order to trade the leaves, processed in rolls known as *mólios*, a complex process which requires intensive family manual labour. The tiny seeds were selected by some planters, who produced shoots which were distributed to the neighbours. Among the tobacco, other plants such as squash and cucumber were grown. The manioc plots were on land that had previously been used other for other crops. In Belfort, the manioc flour was not sold on and together with game meat was the basic diet of the inhabitants. There was a limited number of familiar varieties of manioc that were well-known to the population. Three principal varieties were planted, only one of which was considered 'old' among the local crops. Several previously grown varieties were no longer used. The production of manioc flour, the *farinhada*, also requires family or community labour and was carried out in the community flour producing centre in Belfort. Old plots that had been used for manioc, tobacco or manioc would sometimes be planted with other crops, typically banana, avocado, papaya or cashew.

**b) beach plots:** planted with crops such as varieties of manioc, peanut, watermelon, corn and rice on the banks of the River Juruá in the season when the water level is low, primarily by women. As cattle farming increased, the movement of the cattle along the wide river banks led to most of the inhabitants abandoning the practice of planting on the beach plots.

**c) back/front yards:** many types of fruit trees such as guava, soursop, coconut, avocado or achioté; peppers and other bushes are planted around houses. With the increase in urban density and more cows and pigs wandering around gardens, which were not fenced in, the inhabitants lost many more shoots and saplings, leading to a loss of biodiversity. The houses outside the more densely populated centre consequently had a relatively higher diversity. The seeds for the fruit trees in the gardens studied were sourced from neighbours; brought home from visits to relatives in other villages or the towns that are municipal centres, or picked up from houses on the route.

**d) kitchen gardens:** the kitchen gardens were planted near the houses in old canoes hung



between wooden posts or in fenced in areas of 2 to 4 metres. Decades ago it was just mainly spring onions, coriander and peppers that were grown, but nowadays a much wider variety of plants are grown. The seeds come mainly from a programme to distribute industrialized seeds that is run by the state government of Acre or are bought from agricultural supplies shops in Cruzeiro do Sul.

**e) forest:** a wide variety of plants found growing wild or managed in the forest around Belfort are used by the inhabitants, who rarely plant or store the actual seeds. In other areas of the reserve the expansion of areas of cattle pasture had led to a lack of certain important native species. Consequently some inhabitants began to play a more active role in cultivating forest species, especially mahogany and palms such as açaí, patoá, buriti and bacaba. However, this was not happening in Belfort at the time of the research.

The method used in the survey was to produce an inventory of all the plots, yards and kitchen gardens over the yearly agricultural circle, asking inhabitants about the history of the species and varieties being grown and about the origin of the seeds that were then (2007-8) being planted. Our findings show that there are different levels of the flows of biodiversity, depending on the area being cultivated: the kitchen gardens have an annual life cycle and there is a clear effect of the industrialized seed distribution; the yard plants are more hardy and the seeds obtained are more suitable to opportunities, and in the plots there are significant differences between the activities of planting manioc, tobacco and beans. In all of these areas there are major changes underway.

Generally speaking, the diverse types of social relations relate to the diverse means in which plant types circulate. Kinship relations, *compadrio* (hierarchical friendship) and community relations commonly provide a point of supply for donated plants. The dynamics of geographical movement principally following the rivers (and along the river, influenced by the location of towns and the Peruvian border) also offer routine opportunities to obtain seeds. As does the inheritance of housing, bringing with it an inherited yard and the collecting of seeds and the propagation of plants previously cultivated on plots that have been abandoned by other inhabitants. Finally, contact with outsiders, such as project technicians, political representatives and farmers also has a strong effect on the flows of the agrobiodiversity cultivated.

Another important aspect is the interaction between the inhabitants of Belfort and of the Extractive Reserve of Alto Juruá (Reserva Extrativista do Alto Juruá) with the surrounding society, be they technicians from NGOs, government and/or universities, or farmers, or traders, or others.

Other than this direct contact, the connection between the inhabitants of Belfort and the reserve with the outside world encourages people to travel downriver (towards the municipal centre of Marechal Thaumaturgo and the regional centre, the centre of the municipality of Cruzeiro do Sul) rather than upriver (towards the limits of the reserve with the Peruvian border). As such it creates a number of opportunities for movement of seeds coming to Belfort from downstream and the availability of new plants is limited by the regional structure of mobility.

A question inspired by the research came up: are we facing a geographical simplification of agrobiodiversity? We tend to answer yes; given the processes of increasing urban density, the problems with cattle, the growing dependence on supplies from the town and the present complications of the rubber tappers' political organization. Moreover, judging from how the Peruvian side of the border has been dominated by loggers and the surfacing of the BR364 highway between Cruzeiro do Sul and Rio Branco, it is possible to make catastrophic previsions.

Yet, on the other hand, future processes are unpredictable. There is the intense and enthusiastic production of agrobiodiversity in gardens, plots and around the houses in Belfort. The damage caused to the plants by cattle and pigs deeply irritates the householders of Belfort. There are also ongoing projects to make the inhabitants of the Extractive Reserve of the Upper Juruá (Reserva Extrativista do Alto Juruá) aware of the agro-forestry activities of the indigenous peoples and the

rubber tappers. We must keep an eye on the movement of networks and the socio-ecological flows of agrobiodiversity.

In the case of agrobiodiversity in Belfort we have seen the building of elaborate, complex, nuanced networks of circulation of people and plants, dependent on the relationships established between people, plant species and the forest. The production of knowledge of the inhabitants of Belfort about agrobiodiversity is related to all this complex panorama and its references include kinship relations and those of neighbours, movement of people and money, social movements, life stories and recent regional changes.

## **CONCLUSION: KNOWLEDGE, NETWORKS AND INNOVATION**

The two cases described show that the notion of hybridism can be applied in two ways to the production of knowledge:

a) a hybridism of references that demonstrates that knowledge is produced and legitimised in various ways, implying that the hierarchies between the modalities of knowledge are socio-historical products connected with power relations and that criteria for comparison are based on pragmatic agreements and partial connections.

b) a hybridism of nature-cultures in which humans and non-humans make up heterogeneous networks that reconfigure over time.

These two formulations show that continuities and changes in the way of working with agriculture depend on maintaining or modifying configured networks of natures-cultures and that the knowledge produced as an integral part of these networks can be seen by the logic of its production and not only by its products. Looking from this perspective, a more symmetrical constellation of knowledge appears, in which non-scientific knowledge and non-humans gain importance.

This duly brings nature to the field of politics, freeing it from being the 'other one' of (agri)culture, while we provide agricultural workers with the means to break away from the subaltern role of being producers of lesser knowledge. Reasoning that we are living in a time of disruption of modern logic, to such an extent that we realise that "we have never been modern", then science seems to have to get used to a new hierarchical, non-monarchic level. This may not need any upheaval. Therefore, rather than just bringing together knowledge, what we are hereby proposing is *bringing together a political action* (within a *policy of people and of things*) that is based on the idea of ontological symmetry.

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